

Low Profile Fan Duct System Ingredients Specification

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1 Relevant Documents

Document Number	Document Title
58178-01	Intel Document for Qualification Testing
693943 Rev 01	Enabling Components Qualification Testing
	Low Profile Fan Duct System Design Guidelines
	Low Profile Fan Duct Motherboard and Chassis Specification

2 Scope

The purpose of the Low Profile Fan Duct Ingredient Specification is to provide the necessary boundary conditions to design a Low Profile Fan Duct system that complies with the ***Low Profile Fan Duct Motherboard and Chassis Specification***. The Low Profile Fan Duct must be designed to meet the system integrators environmental requirements. For design recommendations, consult the ***Low Profile Fan Duct System Design Guidelines***.

3 Overview

Although the processor dissipates the maximum amount of heat of the Core Logic components (processor, chipset, graphics, graphics controller, and memory), these complimentary components performance and related power dissipation is increasing. Especially as the Front Side Bus frequency rises. In order to meet these increased thermal demands, additional heat sinks or increased air velocities are required for cooling the Core logic components. The recommended low-cost solution in the ATX and micro-ATX system is to provide a Low Profile Fan Duct that impinges high velocity cool external air directly on the Core Logic components.

4 Thermal Requirements

The primary function of the Low Profile Fan Duct is to cool the Core Logic components while not negatively impacting the cooling of the remainder of the chassis. This is accomplished by impinging cool exterior air at high velocity directly on the Core Logic components. The primary requirement of the Low Profile Fan Duct is that the thermal requirements of the Core Logic components are met. The Fan Duct must be able to provide a minimum volumetric airflow, which will be described in the following sections.

4.1 Inlet Volume Airflow

The Low Profile Fan Duct geometry and inlet vent design must allow a minimum volumetric airflow rate of 20 Cubic Feet per Minute (CFM), using standard 80 mm axial fans. The airflow should be measured at the inlet vent into the chassis with the power supply operating. To minimize acoustic noise, the volume airflow can be reduced at lower ambient temperatures through the use of fan speed control, for more information see the ***Low Profile Fan Duct System Design Guidelines***.

4.2 Inlet temperature: < 35°C

The operating temperature should be measured at the Low Profile Fan Duct inlet vent into the chassis. This temperature is based on Intel's external ambient temperature specification of 35°C (max). If higher ambient temperatures are required, additional thermal design improvements may be needed to meet system and board component temperature specifications, such as additional heat sinks.

4.3 Fan Position

In order to properly cool the core components, the fan position is limited to the zone shown in **Figure 1**.

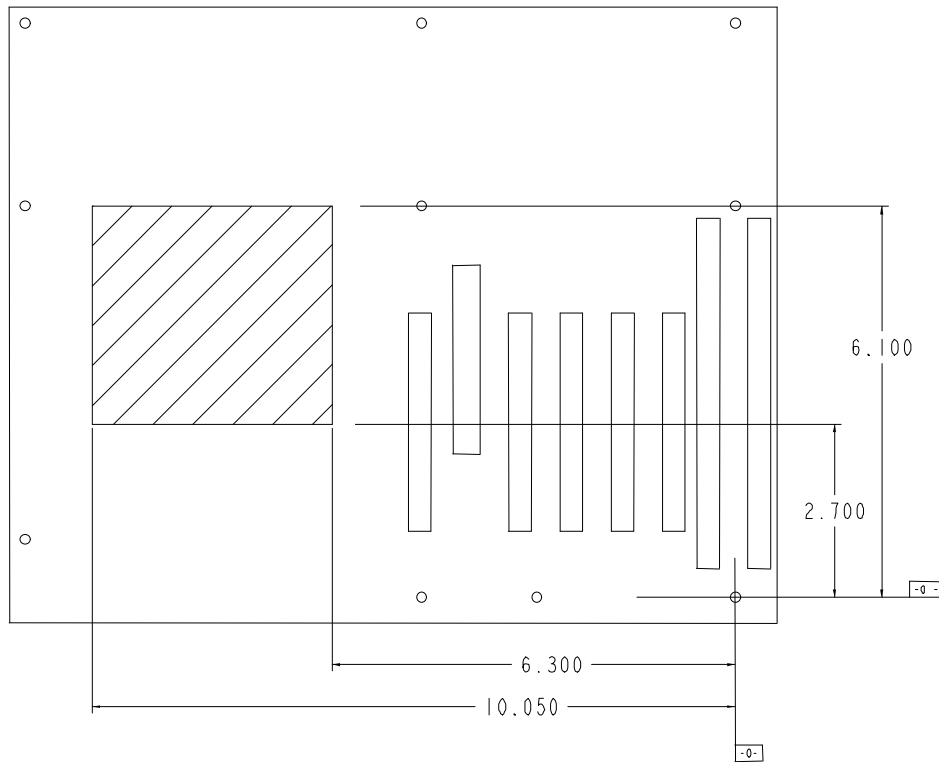


Figure 1. Fan Position With Respect to the ATX and Micro-ATX Motherboard Datum's.

5 Geometry Requirements

The geometry requirements of the Low Profile Fan Duct system must allow for assembly of system-level components including cables, drives, power supplies, and other components. The Fan Duct must meet the following geometry requirements:

5.1 Volumetric Requirements

The volume of the Low Profile Fan Duct system must not exceed the volumes found in the Low Profile Fan Duct Motherboard and Chassis Specification.

5.2 Upgrade Requirements

The Low Profile Fan Duct system must allow for upgrade access to the processor core components.

6 EMI Requirements

The material for the duct used in constructing the Low Profile Fan Duct must be electrically nonconductive. For additional EMI design information, see the *Low Profile Fan Duct System Design Guidelines*.

7 Regulatory Certification Requirements

All plastic material must be UL Recognized under the UL Category of Plastics (QMFZ2) with flammability rating of 94V-1 or 94V-0. Each molded plastic part representing significant fuel to a fire must be UL Recognized under the UL Category of Fabricated Parts (QMMY2).

7.1 Documentation:

Specifications for the Plastics used in Fan duct, if not UL Recognized under another UL Recognition program, must contain the following wording:

MUST BE MADE OF UL RECOGNIZED MATERIAL WITH A FLAMMABILITY RATING OF 94V-1 OR BETTER. THE FABRICATOR MUST BE UL RECOGNIZED. THE UL ASSIGNED CODE DESIGNATION, FABRICATOR'S NAME, P/N FOR THE SPECIFICATION, AND DATE OF FABRICATION MUST BE PROVIDED WITH EACH SHIPMENT.

7.2 Marking Recommendations:

These must be marked on the part (preferred), shipping container, or accompanying documentation (invoice, certificate, etc)

ISO 11469 marking (i.e.. >PC+ABS<)

Resin UL material designation (i.e.. C2800)

Resin vendor (i.e.. GE)

Fabricator's name and UL assigned code designation

Date code - traceability